

REMARKS

Claims 1-11 are currently pending in this application. Claim 1 has been amended to clarify that the amount of perfluoromethyl vinyl ether component unit for preparing the fluororubber is 20.5-22.5 mol percent. This amendment is supported by the description of page 7, line 18-23 "a component unit (a) derived from perfluoromethyl vinyl ether (PMVE) in an amount of from 20 to 23 % by mol, preferably 20.5 to 22.5 % by mol".

Claims 1-11 have been rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,639,838 ("Albano et al."), U.S. Patent No. 6,864,336 (Kaspar et al.) or U.S. Patent Application Publication No. 2003/0236370 ("Grootaert et al."), each individually in view of U.S. Patent No. 3,933,732 ("Schmiegel") or U.S. Patent No. 4,214,060 ("Apotheker et al."). For brevity, reference is made to the Office Action at pages 3-5 for the reasons for rejection.

Applicants respectfully traverse this rejection and request that the rejection be reconsidered and withdrawn.

The law is replete with cases holding that there must be some suggestion or motivation in the prior art to combine the references. When making a rejection under 35 U.S.C. § 103, the Examiner has the burden of establishing a prima facie case of obviousness. In re Fritch, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992).

The Examiner can satisfy this burden only by showing an objective teaching in the prior art, or knowledge generally available to one of ordinary skill in the art, which would lead an individual to combine the relevant teachings of the references [and/or the knowledge] in the manner suggested by the Examiner. Id.; In re Fine, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988).

The mere fact that the prior art could be modified does not make the modification obvious *unless the prior art suggests the desirability of the modification* (emphasis added). In re Fritch, 23 U.S.P.Q.2d at 1784; In re Laskowski, 10 U.S.P.Q.2d 1397, 1398 (Fed. Cir. 1989); In re Gordon, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984).

"The ultimate determination of patentability must be based on consideration of the entire record, by a preponderance of evidence, with due consideration to the persuasiveness of any arguments and any secondary evidence." Manual of Patent Examining Procedure, (Rev. 1, Feb. 2003) § 716.01(d) and In re Oetiker, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992).

Albano et al. disclose a fluoroelastomer comprising from 15 to 45 mole % of perfluorovinylether ("PVE"); from 10-22 mole % of vinylidene fluoride ("VDF"); and from 33 to 75 mole % of tetrafluoroethylene ("TFE"). See Abstract. Albano et al. also disclose that their fluoroelastomers are preferably vulcanized via peroxides and preferably contain iodine and/or bromine atoms along the chain and/or in terminal position of the macromolecules (col. 2, lines 64-67) and can contain 0.5 to 10 weight % of crosslinking co-agents such as triallyl cyanurate and triallyl isocyanurate (col. 3, lines 39-47).

The amount of vinylidene fluoride disclosed by Albano et al. (10-22 mole %) is far less than that of the presently claimed fluororubber (60-70 mole %). Also, the amount of tetrafluoroethylene disclosed by Albano et al. (33-75 mole %) is greater than that of the presently claimed fluororubber (10-20 mole %). Also, Albano et al. do not suggest or disclose including a bituminous fine powder, such as in present claim 1.

Kaspar et al. disclose a fluoroelastomer comprising repeat units derived from 1-20 mole % perfluoromethyl vinylether, 1-30 mole % of a perfluorinated vinyl ether of the formula $\text{CF}_2=\text{CFOCF}_2\text{CF}_2\text{CF}_2\text{OCF}_3$, 40-65 mol % vinylidene fluoride and 10-40 mole % of tetrafluoroethylene. See Abstract. The fluoropolymer can include brominated, iodinated units, or both, to ensure peroxide curing (col. 2, lines 62-63) and can include 0.1-100 parts of coagents such as triallyl cyanurate and triallyl isocyanurate (col. 6, lines 35-39).

The amount of perfluoromethyl vinylether disclosed by Kaspar et al. is less than that of the presently claimed fluororubber (20.5-22.5 mole %). Also, Kaspar et al. do not suggest or disclose including a bituminous fine powder, such as in present claim 1.

Grootaert et al. disclose a fluoropolymer having a reduced amount of polar end groups which can include a copolymer of VDF-TFE-PVE, but does not provide guidance as to the relative amounts of these components, except for a few examples. In Example 1, the resulting polymer had 65.1 mole % of TFE and 33.5 mole % perfluoromethyl vinylether ("PMVE"). In Example 4, the resulting polymer had 70 mole % of TFE and 10.6 mole % PMVE.

In contrast to Grootaert et al., the presently claimed fluororubber has far less TFE (10-20 mole %) and less PMVE (20.5-22.5 mole %). Also, Grootaert et al. do not suggest or disclose including a bituminous fine powder, such as in present claim 1.

The Albano et al., Kaspar et al. and Grootaert et al. references were cited in the rejection as base references, each taken individually in combination with Schmiegel et al. or Apothecker et al. With respect to the teachings of the Albano et al., Kaspar et al. and Grootaert et al. references, none of these references suggests or discloses a fluororubber

sealant having 20.5 – 22.5 mole % PMVE. Further, Albano et al. and Grootaert et al. disclose TFE content well below that presently claimed.

Neither Schmiegel et al. nor Apotheker et al. cure this deficiency in the cited prior art. The Schmiegel et al. and Apotheker et al. references are only cited in the rejection as showing that Austin black can be used in combination with carbon black as a filler in fluoropolymer compositions.

As shown in the attached diagram (Exhibit A) incorporated by reference herein, the fluoropolymer used in the present invention is clearly different from those disclosed by Albano et al. and Kaspar et al. in amount of PMVE. As discussed above, the examples in Grootaert et al. have far more TFE and PMVE than the presently claimed fluororubber.

One skilled in the art would understand that variations in the amount of polymer components can have a profound effect on physical properties, such as heat resistance, freeze resistance and fuel oil resistance.

The fluororubber sealants of the present invention have excellent balance in heat resistance, freeze resistance and fuel oil resistance so that they are suitably used for fluororubber sealants for automobile fuel and the like (see, for example, page 6 lines 1-4).

The amounts of component units of PMVE, VDF, TFE and HFP are selected to achieve the above-mentioned beneficial effect.

Outside the selected ranges, the above-mentioned beneficial effects are not achieved. In Comparative Examples 1 and 2, the fluororubber sealants which used a fluororubber composition having component units of PMVE, VDF, TFE (and HFP) in amounts only slightly outside of the claimed range (see the attached sheet), were tested for low temperature sealing and fuel sealing. In Comparative Example 1, the PMVE was 17 (slightly below the claimed range of 20.5-22.5 mole % PMVE), the VDF was 74 (slightly above the claimed range of 60-70 mole % VDF) and the TFE was 9 mole % (slightly below the claimed range of 10-20 mole % TFE). In Comparative Example 2, the PMVE was 24 (slightly above the claimed range of 20.5-22.5 mole % PMVE), the VDF was 59 (slightly below the claimed range of 60-70 mole % VDF) and the TFE was 17 mole % (slightly below the claimed range of 10-20 mole % TFE).

In testing of Comparative Ex. 1, the fuel leaked out due to inferior fuel oil resistance in the fuel sealing test. In testing of Comparative Example 2, the fuel leaked out due to inferior freeze oil resistance in the low temperature sealing test (see Table 1; page 27, line 5-12 of the present application).

Appl. No. 10/544,296
Amdt. Dated October 24, 2006
Reply to Office Action of May 30, 2006
Attorney Docket No. 1217-051236

The cited references Albano et al., Kaspar et al., and Grootaert et al. do not suggest or disclose the claimed fluororubber, which has well-balanced amounts of component units of PMVE, VDF, TFE and HFP that provide good resistance to high and low temperatures and fuel oil resistance. The cited Schmiegel et al. and Apotheker et al. references do not cure this deficiency in the prior art. As discussed above and as shown in Exhibit A, even Comparative Examples 1 and 2 having very similar amounts of components did not provide acceptable performance on all of these tests.

Therefore, the prima facie case of obviousness has not been established and the rejection should be reconsidered and withdrawn.

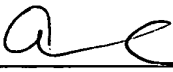
In view of the remarks above, reconsideration and withdrawal of the rejections and favorable allowance of all claims is respectfully requested.

Respectfully submitted,

THE WEBB LAW FIRM

Date: October 24, 2006

By



Ann M. Cannoni
Registration No. 35,972
Attorney for Applicants
700 Koppers Building
436 Seventh Avenue
Pittsburgh, Pennsylvania 15219-1845
Telephone: 412-471-8815
Facsimile: 412-471-4094

